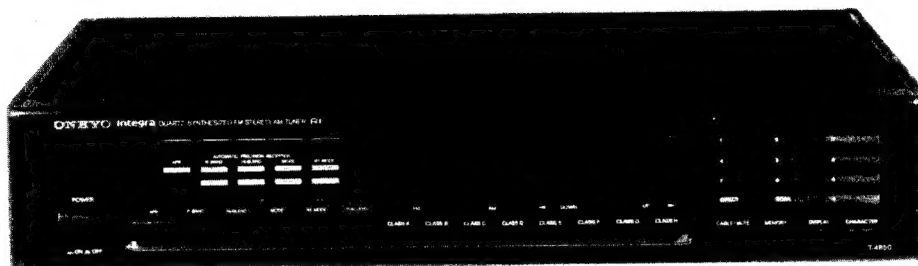


ONKYO SERVICE MANUAL

SYNTHESIZED FM STEREO/AM TUNER MODEL T-4850



Black and Silver models

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK Δ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

FM:

Tuning Range:	87.50 – 108.00 MHz (50/25kHz steps) and/or 88.00 – 108.00MHz
Usable Sensitivity:	Mono: 10.8dBf, 0.95 μ V, IHF 0.8 μ V DIN (75 ohms) Stereo: 17.2dBf, 2.0 μ V, IHF 20 μ V DIN (75 ohms)
50dB Quieting Sensitivity:	Mono: 16.1dBf, 1.7 μ V (75 ohms) Stereo: 36.1dBf, 17 μ V (75 ohms)
Capture Ratio:	1.3dB (Wide)
Image Rejection Ratio:	90dB
IF Rejection Ratio:	90dB
Signal-to-Noise Ratio:	Mono: 85dB, IHF Stereo: 80dB, IHF
Selectivity:	55dB DIN (Narrow)
AM Suppression Ratio:	50dB DIN (Narrow)
Total Harmonic Distortion:	Mono: 0.1% (Wide) Stereo: 0.2% (Wide)
Frequency Response:	30 – 15,000Hz (+0.5 – 1.0dB)
Stereo Separation:	45dB at 1kHz (Wide) 30dB at 70 – 10,000Hz (Wide)
Output Voltage:	0.75V
Muting Level:	17.2dBf, 2.0 μ V (75ohms)

AM:

Usable Sensitivity:	25 μ V
Image Rejection Ratio:	40dB
IF Rejection Ratio:	40dB
Signal-to-Noise Ratio:	40dB
Total Harmonic Distortion:	0.7%
Output Voltage:	150mV

General

Dimensions (W×H×D):	455×90×364 mm 17-5/6"×3-5/8"×14-1/13"
Weight:	4.8kg, 10.6lbs
Supplied accessories:	<ul style="list-style-type: none"> • AM loop antenna×1 • FM T-shaped antenna×1 • Connecting cable×1 • RI remote control cable×1 • 75/300ohm antenna adapter×2 (Except 220V model) • Remote control transmitter

Specifications and features are subject to change without notice.

SERVICE PROCEDURES

1. Memory preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to change the back-up system. Note that since this is not a permanent memory, the power switch must be turned on and off a few times each month to keep the back-up system operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

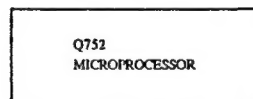
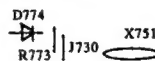
2. Changing the AM band step

With the exception of the worldwide model, AM BAND STEP selector switch is not provided.

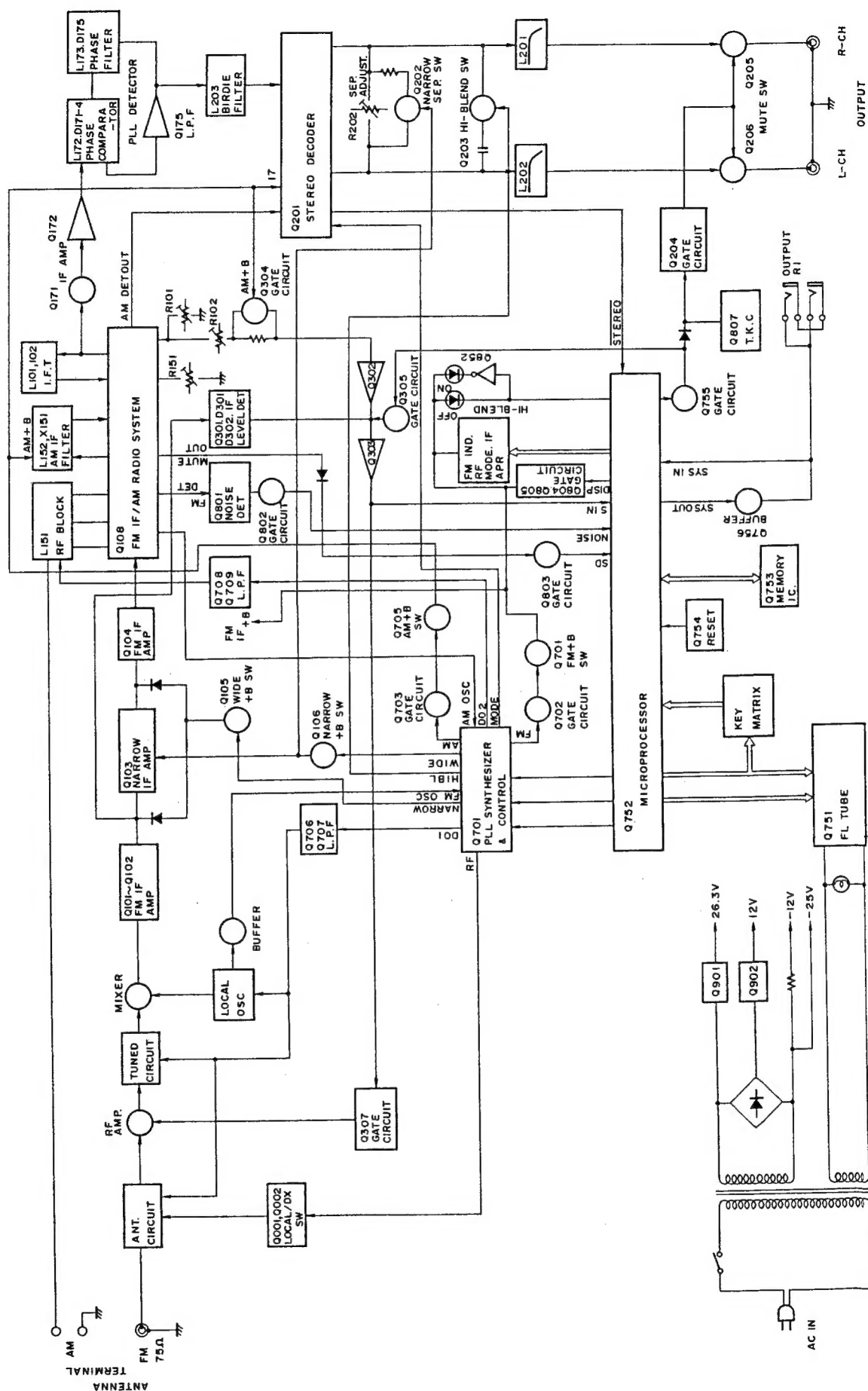
When change the band step, refer the table as shown below.

Band Step	D774	R773	J730
10kHz → 9kHz	Add	Add	Cut
9kHz → 10kHz	Remove	Remove	Short

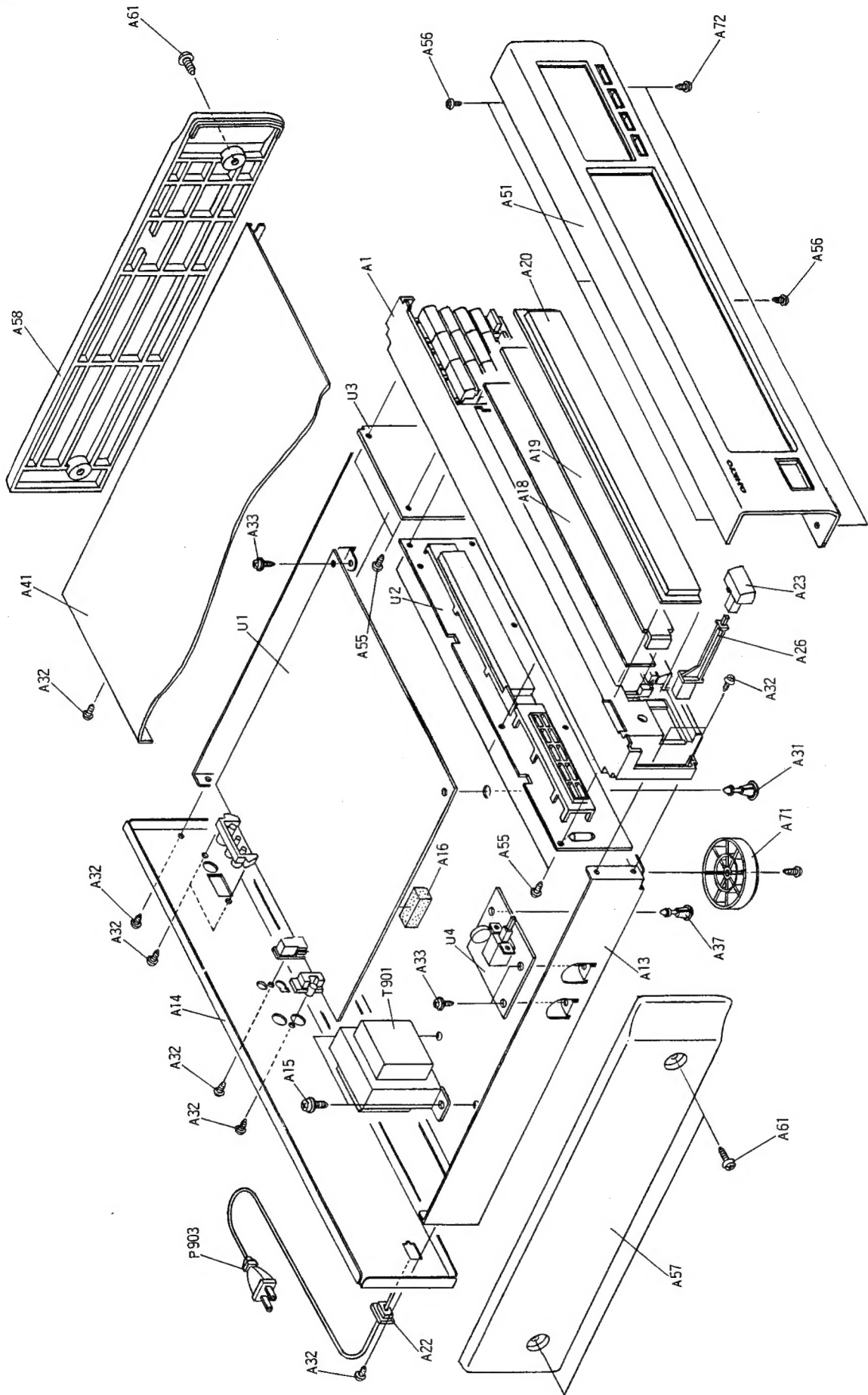
D775 ISS133 Part No. 223163
R775 R16J-10K Part No. 417341034



DISPLAY PC BOARD



EXPLODED VIEW



PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
A1	27110643	Front bracket ass'y 	P903	253148	△ AS-CEE,Power supply cord
	27110644	Front bracket ass'y <S>	T901	2300683A	△ NPT-1114P,Power transformer
A13	27100241	Chassis	U1	1A283581-1A	NARF-4181-1A,Main circuit pc board ass'y
A14	27121458	Back panel	U2	1A283582-1A	NADIS-4182-1A,Display circuit pc board ass'y
A15	830440069	4TTC+6C(BC),Self-tapping screw	U3	1A283583-1	NASW-4183-1,Operation switch pc board ass'y
A16	28140881	14×50×15,Cushion	U4	1A283585-1A	NAPS-4185-1A,Power supply pc board ass'y
A18	28133263	Back plate			
A19	38130261A	Dial plate			
A20	28191598	Clear plate			
A22	27300750	△ Bushing, cord			
A23	28324397	Knob, power 			
	28324398	Knob, power <S>			
A26	27273069A	Joint,power			
A31	27190524	KGLS-14R,Holder			
A32	834430088	3TTS+8B(BC),Self-tapping screw			
A33	831130088	3TTW+8B,Self-tapping screw			
A35	834230108	3TTS+10B(Ni),Self-tapping screw			
A37	27190511	KGLS-16R,Holder			
A41	28184490A	Top cover			
A51	1A285121	Front panel ass'y 			
	1A286121	Front panel ass'y <S>			
A55	833430080	3TTP+8P(BC),Self-tapping screw			
A56	801230	3TTS+8BQ(BC),Self-tapping screw			
A57	28185369	Side panel L			
A58	28185370	Side panel R			
A61	837440169	4TTT+16C(BC),Self-tapping screw			
A62	28135199	Badge			
A71	27175254	Leg			
A72	834430088	3TTS+8B(BC),Self-tapping screw			

NOTE::Only Black model
<S>:Only Silver model

NOTE: THE COMPONENTS IDENTIFIED BY MARK △
ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC
SHOCK. REPLACE ONLY WITH PART NUMBER
SPECIFIED.

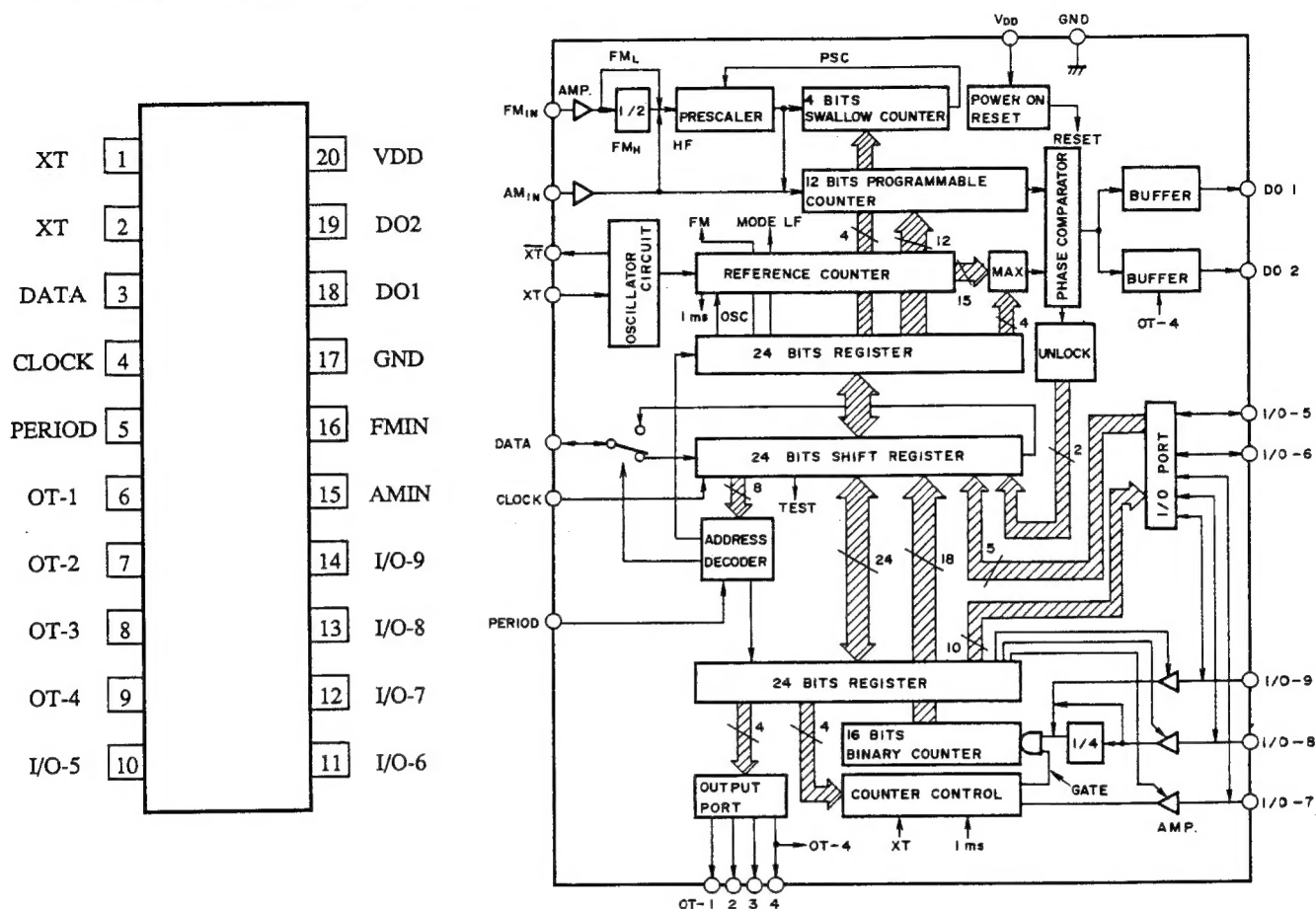
Terminal Description

REF.NO.	Symbol	I/O	Description
1	VKK	O	Power supply terminal for driver of FL tube.
2	S0	O	
3	S1	O	
4	S2	O	
5	S3	O	Segment and key matrix signal output terminals.
6	S4	O	L when active.
7	S5	O	
8	S6	O	
9	S7	O	
10	S8	O	
11	S9	O	
12	S10	O	
13	S11	O	
14	STEREO	I	Stereo broadcast detection input terminal. L when active.
15	RFIN	I	RF input terminal. H when DX.
16	SD	I	Broadcast detection input terminal.
17	SIN	I	Signal strength input terminal.
18	TEST		Test terminal. Connect to the terminal VSS.
19	XIN		Connect to the 4.0MHz ceramic oscillator.
20	XOUT		
21	RESET	I	Reset input terminal.
22	POFF	I	Detection input terminal for stoppage of electric current.
23	MUTE OUT	O	Muting output terminal for tuner section.
24	BAND0	I	Initializing input terminal for band region setting.
25	BAND1	I	
27	NOISE	I	Noise detection input terminal.
28	APR	O	APR ON/OFF indication output terminal.
29	DX	O	RF DX indication output terminal.
30	LOCAL	O	RF LOCAL indication output terminal.
31	IF WIDE	O	IF WIDE indication output terminal.
32	VSS		Ground terminal.
33	IF NARROW	O	IF NARROW indication output terminal.
34	HI BLEND	O	HI-BLEND ON/OFF indication output terminal.

REF.NO.	Symbol	I/O	Description
35	MU MO	O	MUTING MODE MONO/AUTO indication output terminal.
36	ANT	O	Antenna indication and changeover circuit driver output terminal.
37	DISPLAY	O	Segment output terminal of FL tube.
38	PCL	O	Clock output terminal to PLL IC TC9217P.
39	PCE	O	Chip selector output terminal to PLL IC TC9217P.
40	PDOUT	O	Data output terminal to PLL IC TC9217P.
41	SYSIN	I	System code input terminal.
42	SYSOUT	O	System code output terminal.
44	MCS	O	Chip selector output terminal to the memory IC TC89102P.
45	MDI	I	Data input terminal from the memory IC.
46	MDO	O	Data output terminal to the memory IC.
47	MCLK	O	Clock output terminal to the memory IC.
48	K0	I	
49	K1	I	Key matrix input terminals.
50	K2	I	
51	K3	I	
52	D9	O	
53	D8	O	
54	D7	O	
55	D6	O	Digit output terminals.
56	D5	O	
57	D4	O	
58	D3	O	
59	D2	O	
60	D1	O	
61	S14	O	
62	S13	O	Segment output terminals.
63	S12	O	
64	VDD		Power supply terminal.(5V)

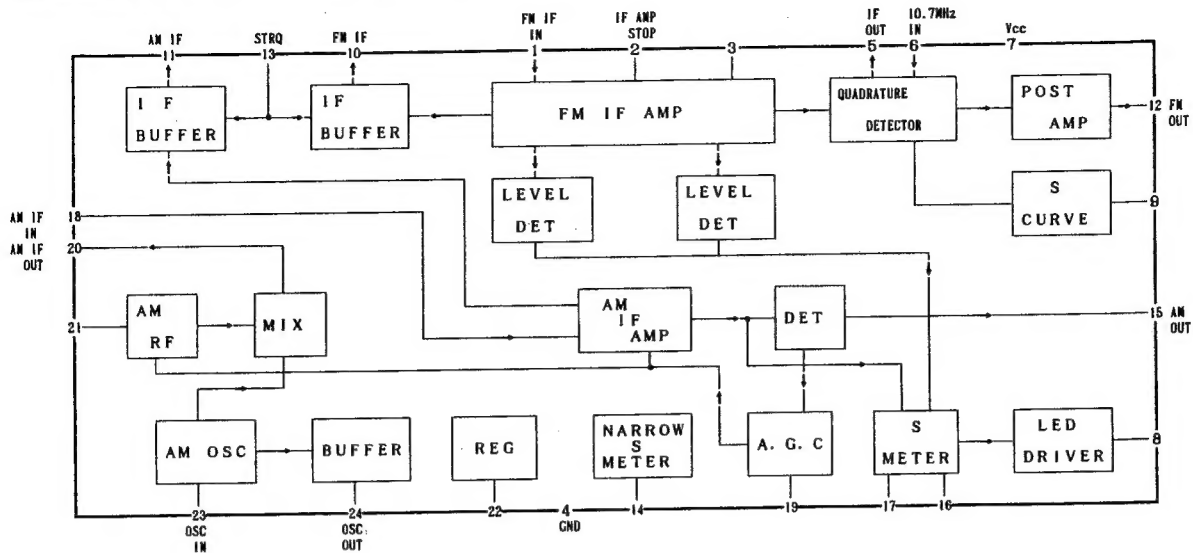
BLOCK DIAGRAMS OF IC

LC7218P (PLL synthesizer and controller)

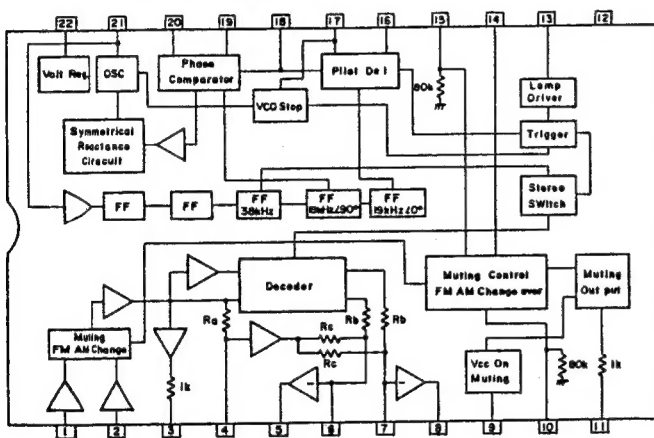


Pin No.	Symbol	Description
1	XT	Crystal oscillator
2	XT	connection terminal
3	DATA	Serial data input/output terminal
4	CLOCK	Clock signal input terminal
5	PERIOD	Period signal input terminal
6	OT-1	Output terminal for changeover circuit of FM band. H when FM.
7	OT-2	Output terminal for changeover circuit of AM band. H when AM.
8	OT-3	Output terminal for changeover circuit of RF. H when LOCAL. L when DX.
9	OT-4	Not used.
10	I/O-5	Output terminal for changeover circuit of FM IF band. H when WIDE.
11	I/O-6	Output terminal for changeover circuit of FM IF band. H when NARROW.
12	I/O-7	Output terminal for changeover circuit of Hi-blend. H when ON.
13	I/O-8	Output terminal for changeover circuit of MUTE/MODE. H when MONO. L when AUTO.
14	I/O-9	Output terminal for time constant changeover of PLL LPF.
15	AMIN	AM local oscillator signal input terminal.
16	FMIN	FM local oscillator signal input terminal.
17	DO1	Phase comparator output terminal.
18	DO2	Phase comparator output terminal.
19	GND	Ground terminal
20	VDD	Power supply terminal

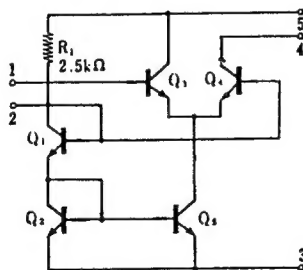
LA1266A (FM IF & AM radio system)



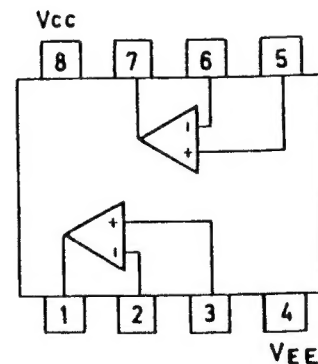
LA3401 (Stereo decoder)



TA7060AP (FM IF amp)

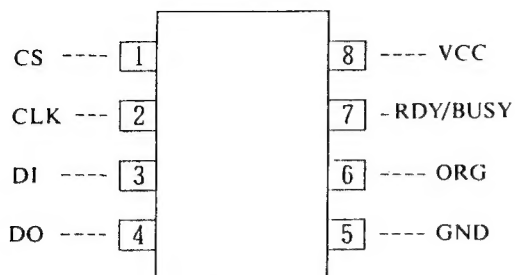


NJM4565S-B/BA15218N (OP amp)

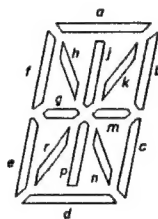
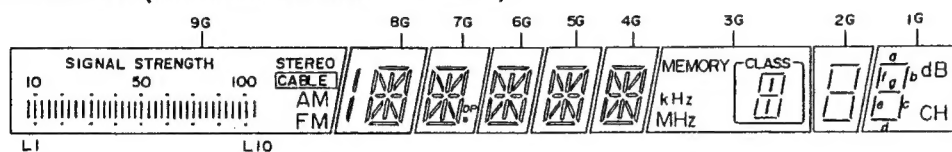


TC89102P (2048 bits EEPROM)

(EEPROM: Electrically Erasable Programmable Read Only Memory)



Pin No.	Symbol	Description
1	CS	Chip selector input terminal
2	CLK	Clock input terminal
3	DI	Serial data input terminal
4	DO	Serial data output terminal
5	GND	Ground terminal
6	ORG	Memory constructional selector input terminal.
7	RDY/BUSY	Status output terminal
8	VCC	Power supply terminal

FIP13FM8 (Fluorescent indicator tube)**PIN CONNECTION**

TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
ELECTRODE	F1	F1	NP	NP	Sp	Sr	Sdp	NP	NP	NP	NP	NP	NP	NP	NP	NP	G1	G2	G3	G4	G5	G6	G7	G8	G9
TERMINAL NO.	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	
ELECTRODE	NP	NP	NP	NP	NP	NP	NP	NP	Sa	Sb	Sc	Sd	Se	Sf	Sg	Sh	Si	Sk	Sm	Sn	NP	NP	F2	F2	

NOTE: F:Filament G:Grid S:Anode

ANODE CONNECTION

Pin No.	52	53	54	55	56	57	58	59	60
Pin No.	D9	D8	D7	D6	D5	D4	D3	D2	D1
2	Sa	SIGNAL STRENGTH	a	a	a	a	a	a	a
3	Sb	L1	b	b	b	b	b	b	b
4	Sc	L2	c	c	c	c	c	c	c
5	Sd	L3	d	d	d	d	d	d	d
6	Se	L4	e	e	e	e	e	e	e
7	Sf	L5	f	f	f	f	f	f	f
8	Sg	L6	g	g	g	g	g	g	g
9	Sh	L7	h	h	h	h			
10	Si	L8	i	i	i	i	i		
11	Sk	L9	k	k	k	k	MEMORY		
12	Sm	L10	m	m	m	m	m		
13	Sn	STEREO	n	n	n	n	kHz		dB
63	Sp	CABLE	p	p	p	p	p		CH
62	Sr	AM	r	r	r	r	MHz		
61	Sdp	FM	/	dp			CLASS		

ADJUSTMENT PROCEDURES

- Preparation
FM mono: 1kHz, 75kHz devi. 60dB μ (65dBf)
FM stereo: 1kHz, L+R 67.5kHz devi.,
Pilot signal 19kHz 7.5kHz devi.
AM: 400Hz, 30% mod.

- Set the operation keys as shown below.
HI-BLEND: OFF
RF MODE: DX
IF BAND: WIDE
CABLE/MUTE: CABLE

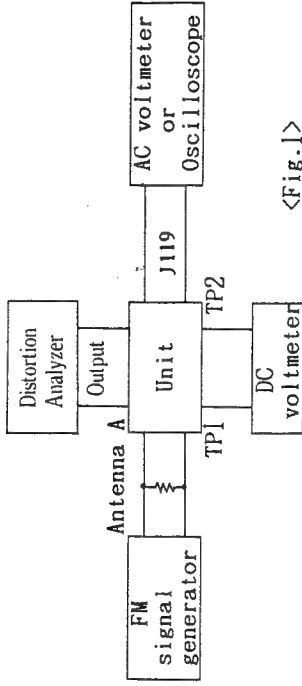
FM section

Item	Step	Connection of instrument	FM SC output	Stereo modulaotr output	Tuned frequency	Output indicator	Adjustment point	Adjust for	Remarks
FM RF/IF	1	Fig. 1	98.1MHz, 1kHz 75kHz devi. 25dB (30dBf)	—	98.1MHz	AC voltmeter	IFT core on front end	Maximum	
	2		60dB (65dBf)			DC voltmeter	L101	0±20mV	Repeat the steps 2 and 3 until no further adjustment is necessary.
	3					Distortion analyzer	L102	Minimum	
FM DET		Fig. 2	98.1MHz, No mod. 60dB (65dBf)	—	98.1MHz	DC voltmeter	L173	0±0.1V	RF MODE:DX
STEREO DISTORTION		Fig. 3	98.1MHz, Ext. mod. 60dB (65dBf)	L+R 67.5kHz devi. Pilot signal 7.5kHz devi.	98.1MHz	Distortion analyzer	IFT core on front end	Minimum	Don't turn more than 180°
STEREO SEPARATION		Fig. 3	98.1MHz, Ext. mod. 60dB (65dBf)	Channel L	98.1MHz	AC voltmeter of right channel	R202	Minimum	Maximum and same separation.
				Channel R		AC voltmeter of left channel		Minimum	
MUTING LEVEL		Fig. 2	98.1MHz, 1kHz, 75kHz devi. 13dB (18.2dBf)	—	98.1MHz	Oscilloscope	R101	Output: ON	CABLE/MUTE SW: OFF CABLE indicator is turned off.
			12dB (17.2dB)					Output:OFF	
SIGNAL STRENGTH		Fig. 2	60dB (65dBf)	—		10th signal strength	R102	Light on	

AM section

Step	AM SG output	Tuned frequency	Output indicator	Adjustment point	Adjustment for
1		522kHz	DC voltmeter	OSC coil on L151	1.3 \pm 0.1V
2	603kHz 400Hz, 30% mod.	603kHz	AC voltmeter	RF coil on L151	Maximum
3	990kHz	990kHz	AC voltmeter	L152	Maximum
4	990kHz 55dB/m	990kHz	6th signal indicator	R151	Light on

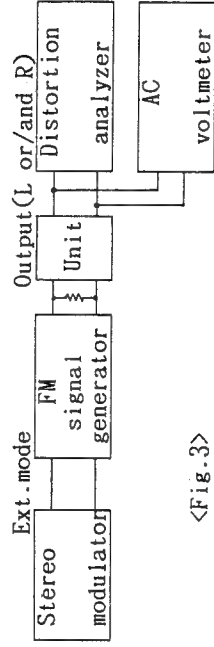
Reference specifications
Tuned voltage AM: 10kHz step models
1.3 \pm 0.4V~7.5 \pm 0.4V(530kHz~1710kHz)
9kHz step models(European models)
1.3 \pm 0.4V~7.0 \pm 0.4V(522kHz~1611kHz)
9kHz step models(Worldwide models)
1.3 \pm 0.4V~7.0 \pm 0.4V(531kHz~1602kHz)
FM: 5 \pm 0.4V~25 \pm 0.4V(87.50MHz~108.00MHz)
Auto stop level AM: Less than 68dB/m
FM: Less than 16dB μ



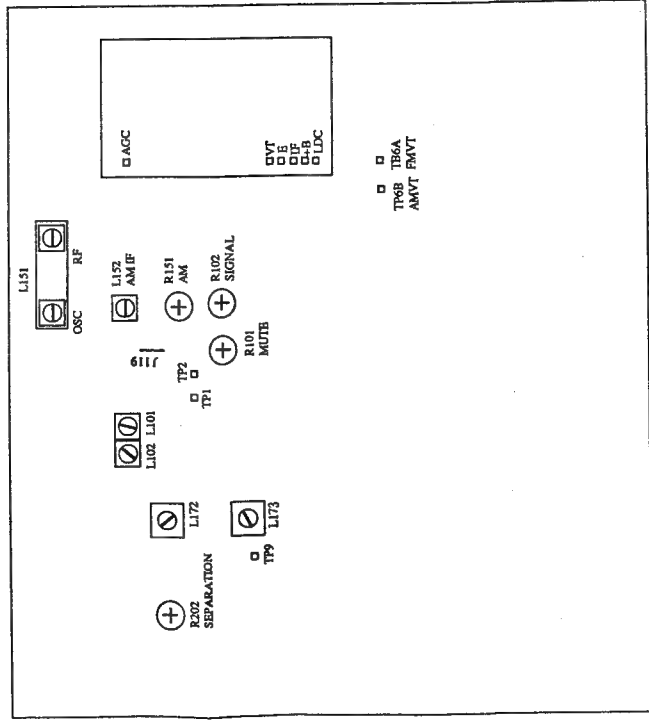
<Fig. 1>



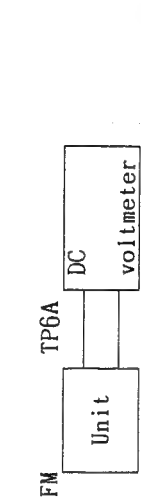
<Fig. 2>



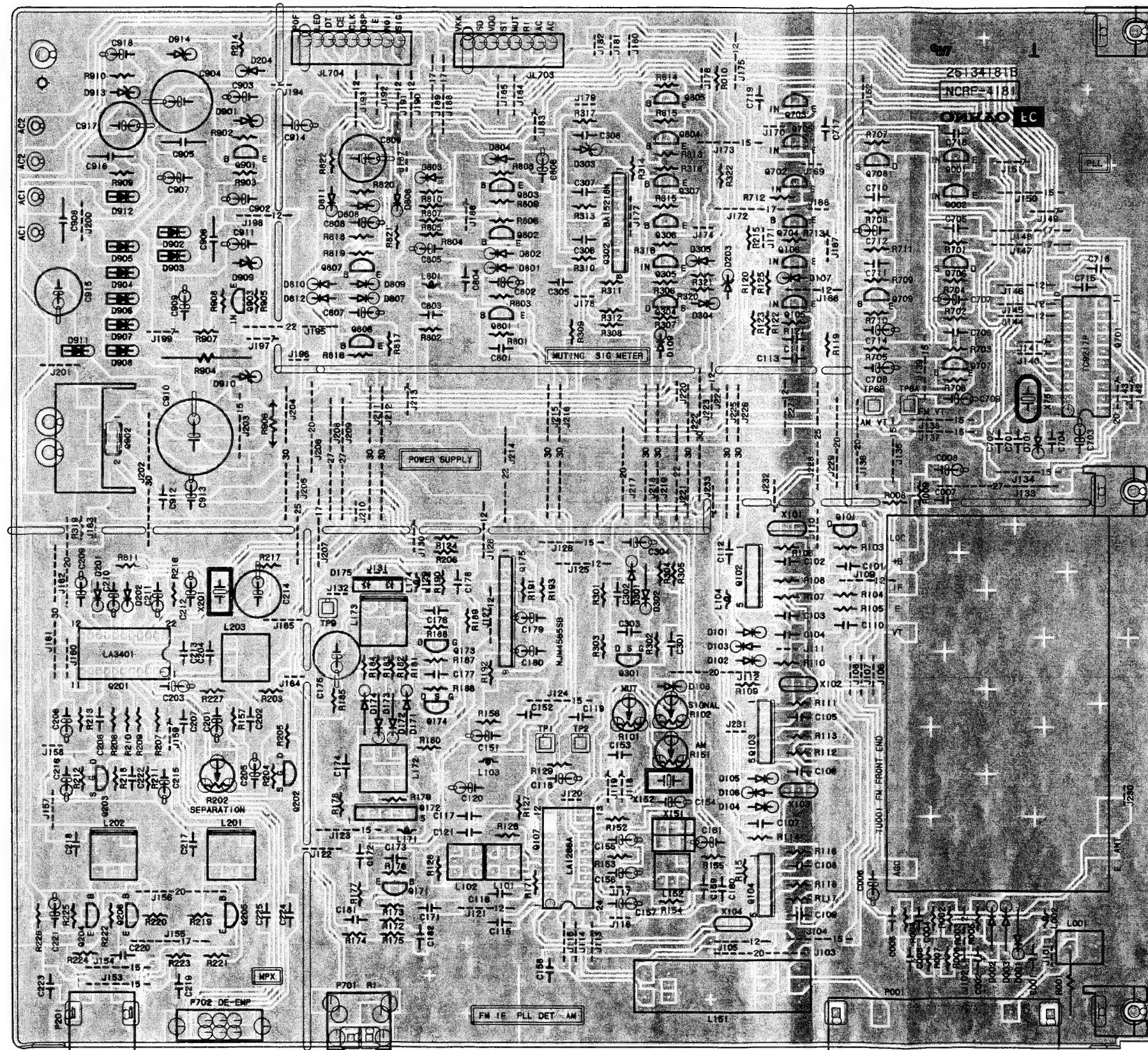
<Fig. 3>



Confirmation of tuned voltage



MAIN CIRUCIT PC BOARD





CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C712	354780229	2.2 μ F,50V,Elect.
C714,C805	354782299	0.22 μ F,50V,Elect.
C807	354744709	47 μ F,16V,Elect.
C808	354741009	10 μ F,16V,Elect.
C809	354744719	470 μ F,16V,Elect.
C902,C918	354761009	10 μ F,35V,Elect.
C903	354761019	100 μ F,35V,Elect.
C904	354784719	470 μ F,50V,Elect.
C907	354781019	100 μ F,50V,Elect.
C909	354764709	47 μ F,35V,Elect.
C910	354762229	2200 μ F,35V,Elect.
C911	354781009	10 μ F,50V,Elect.
C913	354742209	22 μ F,16V,Elect.
C915	354763319	330 μ F,35V,Elect.
C917	354764719	470 μ F,35V,Elect.
	Resistors	
R101	5210070 or 5210221	N06HR100KBD or N06HR100KBC,Semi-fixed
R102,R202	5210072 or 5210124	N06HR220KBD or N06HR200KBC,Semi-fixed
R151	5210064 or 5210119	N06HR10KBD or N06HR10KBC,Semi-fixed
R904	441620624	6.2 Ω ,1W,Metal oxide film
R906	442521614	160 Ω ,1/2W,Metal oxide film
	Terminals	
P001	25060087	NTM-2PDMN31
P201	25045333	NPJ-2PDBL185
P701	25045172	HSJ1003-01-020
P703	25050272	NSCT-8P-100
P704	25050273	NSCT-9P101
	Radiator	
P901	27160179	RAD-57
	Screw	
P902	82143006	3P+6FN(BC)

DISPLAY CIRCUIT PC BOARD(NADIS-41821-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	FL tube	
Q751	212100	FIP13FM8
	ICs	
Q752	22240543	TMP47C1270N-V209 TMP47C1270N-V208 (Before modification)
Q753	22240475	TC89102P
	Transistors	
Q754,Q755	221282	DTC144ES
Q756	2211455	2SA1015-GR
Q851,Q852	221282	DTC144ES
	Lamp	
PL751	210064B	PL6.3V250mA
	Diodes	
D751	224450472	MTZ4.7B
D753-D763	223163	1SS133
D764	224450562	MTZ5.6B
D765-D774	223163	1SS133

CIRCUIT NO.	PART NO.	DESCRIPTION
	L.E.Ds	
D851,D853	225137CG,	SEL2413ECG,
D855,D857	225137DG or	SEL2413EDG or
D858	225137DY	SEL2413EDY
D852,D854	225142	SEL2913K
D856,D859	225142	SEL2913K
	Ceramic oscillator	
X751	3010150	CST4.00MGW
	Capacitors	
C752	353780109	1 μ F,50V,Elect.
C753	353780479	4.7 μ F,50V,Elect.
C754	375524744	0.47 μ F \pm 5%,50V,Plastic
C755	3000057	0.1F,5.5V,Super
C757	353780109	1 μ F,50V,Elect.
C758	353761009	10 μ F,35V,Elect.
	Resistors	
R766	49163103404	10k Ω \times 4,1/10W,Network
R767	49163333404	33k Ω \times 4,1/10W,Network
	Switches	
S751-S768	25035548	NPS-111-S510,Push
	Holder	
	27190845A	LED-10

OPERATION SWITCH PC BOARD(NASW-4183-1)

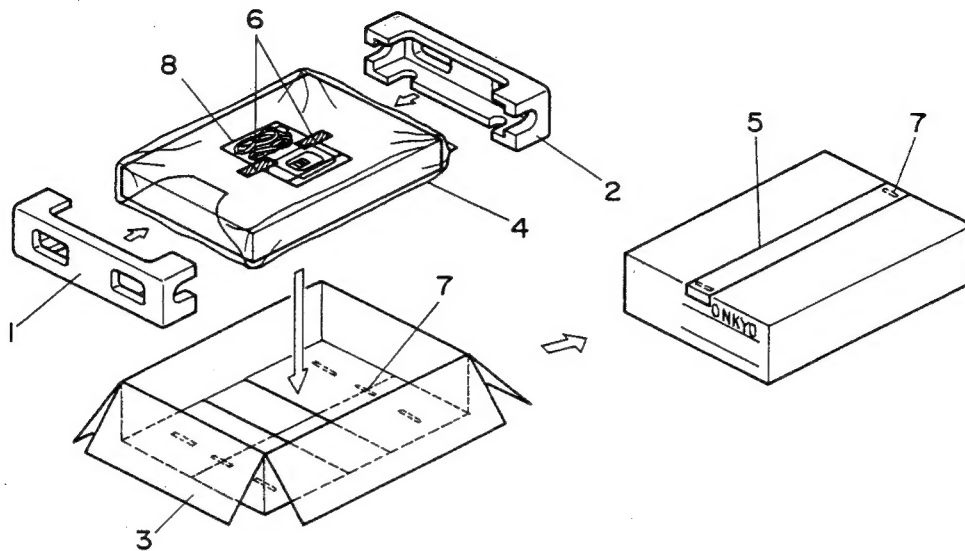
CIRCUIT NO.	PART NO.	DESCRIPTION
	Switches	
S771-S786	25035548	NPS-111-S510,Push

POWER SUPPLY PC BOARD(NAPS-4185-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitor	
C901	3500065A	Δ DE7150FZ103PAC400V/125V,IS
	Switch	
S901	25035636	Δ NPS-111-L590P

NOTE: THE COMPONENTS IDENTIFIED BY MARK Δ
ARE CRITICAL FOR RISK OF FIRE AND
ELECTRIC SHOCK. REPLACE ONLY WITH
PART NUMBER SPECIFIED.

PACKING VIEW



REF.NO.	PART NO.	DESCRIPTION
1	29091495	Pad L
2	29091496	Pad R
3	29052209	Master carton box
	29052210	Master carton box <S>
4	29100037A	650×500, Styrene bag
5	29110071	Damp tape
6	261504	Adhesive tape
7	282301	Sealing hook
8	Accessory bag ass'y	
	29341637	Instruction manual
	29100097	350×250, Styrene bag
	292092	FM antenna
	232140	NMA-3057, AM loop antenna
	2010098	Connection cord
	2010200	Connection cord RI
	29365020C	Warranty card
	29100094A	Styrene bag for warranty card

NOTE: : Only Black model
<S>: Only Silver model

ONKYO CORPORATION

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